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ABSTRACT

This study examined the effects of music on the motivation of 22 female and 5 male swimmers ages 10-13 years. These age-group swimmers practiced 2.0-2.5 hours per day and had six training sessions per week. Using observation logs, surveys, and open-ended questions, the study analyzed swimmers' perceptions of, and behavior when, listening to music during practice. The researcher observed swimmers' behavior in non-music conditions to establish a baseline and also observed them after the introduction of music during practice. The observation log helped categorize types of behavior and apparent attitudes during music and non-music conditions. Swimmers completed a survey that asked how they felt about music being played during practice. The open-ended questionnaire solicited their responses to music in an athletic setting and in an academic environment. Both the observations and feedback from swimmers indicated that listening to music during practice improved swimmers' attitudes and mood states, thereby enhancing their athletic performance. Swimmers pointed out that having music playing while giving instructions was distracting and counterproductive. Three appendixes contain the observation log, the survey, and the questionnaire. (SM)

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The Effects of Music on Age Group Swimmers' Motivation and Practice Behavior

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Abstract

Music is commonly used in and around sporting events, in gyms, aerobic classes, and in personal training. The present study examined the effects of music on the motivation of 22 female and 5 male age group swimmers between the ages of 10 and 13. Using observation logs, surveys, and open-ended questions, swimmers' perception of music listening during practice was analyzed. Results supported the hypothesis that music listening during practice improves swimmers' attitudes and mood state, thereby enhancing athletic performance according to swimmers' perceptions. In general, it was concluded that music can be an effective tool in motivating swimmers and a powerful reinforcer when used as a contingent reward for a specific behavior.

The effects of music on age group swimmers' motivation and practice behavior

Introduction

Have you ever been to a sporting event where music is played before the event begins or at half-time? Have you ever taken an exercise course or class where the routine was set to music? Have you ever went for a run or used gym equipment while listening to a headset? These observations indicate that music is used in a number of ways; to entertain, to provide a rhythm, to encourage, and to motivate. In our society, music and athletics seem to be intricately related. If sports and music have some type of relationship, then it seems logical to investigate in what ways this relationship can be beneficial and in what ways it may be detrimental. In the case of age-group (ages 5 to 12) swimmers, how might music be used to motivate and enhance athletic performance? These are a few of the inquiries this study seeks to investigate in further detail in an effort to add to past research in this area. The present study will serves as a framework for further research. This paper seeks to analyze the underlying effects of using music in an athletic setting through observation, surveys, and children's narrative responses. Four hypotheses will be investigated: (1) Music makes swim practice more enjoyable for the athletes. (2) Music improves attitude and mood, thereby enhancing athletic performance. (3) Swimmers perceive music as a reward and are willing to earn the privilege of having music in practice. (4) Music can be a tremendous distraction if used at inappropriate times.

Research by Courneya and McAuley (1991) investigated the ways in which children are rewarded for their participation in sports and in what ways that effects their motivation. The study suggested that children respond to rewards in different ways, depending on the size of the reward and whether or not they are intrinsically motivated to participate in the sport. The study used 143 undergraduate students enrolled in courses associated with physical activity (e.g. kinesiology). Participants were randomly assigned to read scenarios in which the child was either extremely interested (high interest) in the

activity or not interested (low interest) in the activity. Each scenario used either a 6 or 10 year old boy or girl as the subject and involved one of 8 motivational strategies. High control motivational strategies included large and small task-contingent rewards, as well as large and small punishments. Low control strategies, on the other hand, included reasoning, intrinsic attribution, task embellishment, and noninterference. After reading each scenario, the participants were asked to rate how effective they thought the motivational strategy used in the scenario would be on long term interest and enjoyment of the sport.

Courneya and McAuley (1991) suggested that the larger the reward given for intrinsically motivated behaviors, the greater the negative effect the reward will have on that behavior. The minimal-sufficiency principle, as coined by child psychologist M.R. Lepper (Courneya and McAuley, 1991), states that the smallest possible reward or motivational strategy should be used when intrinsic motivation is high. Furthermore, earlier studies have found that parents often use tangible rewards (high control strategies) in both high and low interest conditions. Since parents perceive academic behavior as "work," they may forget to consider the child's motivation (intrinsic or extrinsic) and assume a tangible reward will produce a long term interest in that area.

Courneya and McAuley (1991) found that the high control strategies were preferred in the low interest condition over low control strategies and, conversely, low control strategies were preferred in the high interest condition over high control strategies. That is, when children were already motivated to participate in the sport or activity, participants felt that strategies such as rewards (large/small) or punishment (large/small) would be less effective in promoting a long term interest in the sport. Likewise, adults thought low control strategies (such as task embellishment, intrinsic attribution, reasoning, and noninterference) would be less effective in motivating children that were not already intrinsically motivated to participate in the sport or activity.

This study concluded that results were consistent with the minimal-sufficiency

principle. In other words, distinctions were consistently made between high and low interest conditions for each motivational strategy and high interest conditions were paired with low control strategies and low interest conditions with high control strategies. In general, low control strategies were thought to be more effective than high control strategies. These conclusions imply that if an adult perceives a child as actively pursuing a sport or activity, the necessity for a large reward will diminish. This is the same explanation as to why parents tend to use large rewards in academic situations, as the child's involvement is not perceived as a choice, and therefore the adult does not differentiate between high and low interest conditions. The potential harm in this over-generalization of motivational strategies, or the ignoring of the minimally-sufficient principle, lies in the fact that past research indicates that extrinsic rewards can severely undermine or discourage intrinsic motivation. So what type of rewards should be used for age-group swimmer to have a lasting effect on motivation without diminishing intrinsic motivation?

A study conducted by Hume and Crossman (1992) found that music can significantly and immediately increase the amount of productive behavior, while simultaneously decreasing the amount of unproductive behavior, during a dry-land exercise program for a group of swimmers. To test the effects of music on swimmer's productive versus non-productive behavior, researchers established guidelines for what constituted productive or non-productive behavior, and then observed swimmers during a dry-land exercise (e.g. sit-ups, push-ups) program. Essentially, productive behaviors involved being on-task, doing what the instructor had asked, and behaving in a manner that was likely to improve future athletic performance. Non-productive behaviors (e.g., talking with friends) were considered actions that would have a detrimental, or no effect at all, on future athletic performance.

The use of music during the dry-land exercise program was the method of intervention researched. Before the study began, swimmers filled out a questionnaire

indicating their music preference. Swimmers were placed in two groups: a contingent reinforcement group and a non-contingent reinforcement group. The contingent reinforcement group was told that a 15% improvement in productivity over the baseline average (determined in advance through observations) would result in music being played the following day during dry-land exercises. The non-contingent group, however, had no control over whether or not music was played. If the contingent group earned music, the non-contingent group also heard the music the following day.

Hume and Crossman (1992) found the musical reinforcement condition brought about a significant improvement in productive behavior of the contingent group over baseline conditions. Not only was there an increase in the percentage of productive behaviors, but non-productive behaviors saw a sharp decline. A return to the baseline condition showed a profound increase in the level of non-productive behavior. A post-study questionnaire indicated that all swimmers enjoyed having music as part of the dry-land exercise program. The swimmers in the contingent condition, felt it was easier to warm-up with music playing and were willing to work harder if they thought their effort would be rewarded with music. The coaches comments during an unstructured interview, as well as his questionnaire responses, supported the athletes' opinions when he noted that music made it easier for the swimmers to warm-up. Furthermore, the coach claimed to have noticed a decrease in the amount of conversation during exercise and an increase in the amount of productive behavior.

Hume and Crossman (1992) concluded that using music as an intervention increased productive behaviors, whereas withholding the intervention led to an immediate decrease in productive behavior and an increase in non-productive behavior. In essence, the contingency of music was viewed as a reward by athletes, as participants reported more enjoyment of practice with music present. The results of the study further suggest that music can be an effective means of reinforcement when contingent upon the behavior of a group. What implications does this study have for the classroom teacher?

If the group is a class of students, in what ways could music be used as a contingent reward to enhance academic performance? Is there a way to effectively blend music and learning without diminishing students' concentration?

Madsen and Forsythe (1973) investigated the effects of a contingent reward, listening to music in this case, on academic effort and accuracy of sixth grade students. More specifically, the study sought to determine whether a contingent based reward such as listening to music would increase the number of correct responses in a mathematical task, relative to other rewards or activities.

Eighty-eight sixth grade students were randomly assigned to one of four groups. Two groups involved listening to music, one with headphones the other in a more social atmosphere. There were 2 control groups. One control group played math games (already a part of the teacher's reward system) and the other control group received no reward, regardless of the number of correct responses. Math games were already a part one classroom's math instruction, but since a clear contingency had not been explained to the students, this group served as a second control. Madsen and Forsythe (1973) conducted a survey to determine what types of music the children preferred. Using materials they were familiar with, children were asked to work out problems on a card and when finished move on to the next card. The following day, the number of correct answers were totaled and recorded. Each correct answer equaled one minute of music for students in the contingent music listening categories.

Madsen and Forsythe (1973) found the results for both music listening groups to be very similar, but significantly different from both control groups. Likewise, the two control groups were not noticeably different from one another, but were considerably different from the music listening groups. The researchers concluded that music listening was effective in increasing the number of correct responses to mathematical problems and that there was no difference between the types of music listening activities (i.e. headphones). The results support previous research suggesting that music activities can

serve as strong reinforcers of nonmusical behavior (Madsen and Forsythe, 1973). Furthermore, this study has some important implications for teachers. Short, contingency based reward systems during a relatively short work period, using music as the reward versus other classroom activities, can have a profound impact on student's on-task behavior and overall work output. As past research has demonstrated, music can be used to motivate and reward children in both athletic and academic settings.

It is reasonably apparent that music being played during training sessions provides a strong incentive for children to remain on-task, as long as the reward is contingent upon a specific behavior and those expectations are made clear to the children. This paper, however, seeks a deeper understanding of the children's perception of music as a contingent reward and how they feel it motivates (or distracts) them as individuals. Perhaps they are motivated because swimmers are aware, either consciously or otherwise, that music enhances their mood state, their athletic performance, and lowers the perceived amount of work being done during exercise (Karageorghis and Terry, 1997). Or possibly swimmers enjoy the atmosphere that music creates and feel as if they are being rewarded for their hard work. Whatever the case, there is a tremendous amount of research supporting the positive effects of music on athletes' attitudes, mood state and performance. The present study further explores these positive effect through age group swimmer's perceptions of music listening during training sessions.

Method

Participants

This study was conducted at Smith Pool in Charlottesville, Virginia. The 27 swimmers participating in the study were volunteers. This group of swimmers contains the top 10, 11, and 12 year-olds on the Charlottesville Y Aquatic Club (CYAC). These age-group swimmers practice 2.0 to 2.5 hours per day and have 6 training sessions per week. Ages of the swimmers ranged from 10 to 13 years old, although 65% of the participants were between the ages of 11 and 12 years old. Twenty-two of the

participants were female and 5 were male. The participants were not compensated for their time, as all observations and tests were conducted during practice time.

Materials

A number of materials were used and created in an attempt to examine swimmers' attitudes toward having music as a part of swim practice, as well as a part of the classroom environment. The instructor used a stopwatch to measure the length of time it took swimmers to give the coach their full attention once a prompt was given. This data, along with observations of the athletes in music and non-music conditions were recorded on an observation log (Appendix A). A survey was used as the second measure to evaluate children's perception of music listening during training sessions. The survey asked swimmers to rate their responses to 12 statements (such as, "Listening to music during practice makes me swim faster.") on a Likert scale (Appendix B). An open-ended questionnaire (Appendix C) gave swimmers the chance to respond to questions (For example, "Describe how you feel when music is being played during practice.") confidentially and with no time constraints. Lastly, a JVC portable stereo was used as the music source. It was capable of very high decibels and was usually played at very high volumes. Compact discs were played while swimmers participated in dry-land exercises, while they were swimming, changing gear, and during kick sets. The compact discs being played included, "Jock Jams Volume 4," "Techno Mix '98," and "Pure Disco2." These measures were used in an effort to analyze the ways in which music affected children's behavior, attitude, listening skills, and motivation during training sessions. Through observations and test measures, such as a Likert scale and open-ended questions, general thought processes and children's perceptions in regard to these issues were explored.

Procedure

Initially, the instructor observed the swimmers' behavior in non-music conditions to establish a baseline for further observations in a music listening condition.

Observations were recorded in an observation log to establish a pattern of behavior that was typical of each condition. It is important to note that music was not played while the instructor was giving explicit instructions or teaching the children new skills. As a part of the observations being made, the coach obtained an empirical figure for the length of time it took swimmers to give the coach their full and complete attention once the phrase, "May I have your attention, please" had been spoken. The phrase was announced following either a music or non-music condition (10 times in each category). The stopwatch was started at the completion of the sentence and stopped when 100% compliance was obtained.

A second test measure was used to evaluate the group's attitude and opinion regarding music in an athletic setting, an academic setting, and to what degree they felt music motivated them during each training session. Swimmers were asked to complete a survey (Appendix B) in which they rated their responses to 12 questions on a Likert scale (1 to 5). A response of 1 indicated total agreement with the statement, whereas a 5 indicated total disagreement with the statement. The directions were reviewed with the children and they were allowed as much time as necessary to complete the task.

Lastly, children were given an open-ended questionnaire that solicited their responses to four questions regarding music in an athletic setting, as well as an academic environment. The questions were first read allowed to the swimmers and no time constraints were given in which to finish this task. (Note: Observations, surveys, and open-ended questionnaires were given on separate days, a week apart).

Although this study uses some quantitative test measures, the objective was only to support the qualitative findings with empirical data. The emphasis of this study was to investigate swimmers' behaviors and attitudes toward music in an athletic setting. Athlete's perception of music being played during practice and their perception of training intensity during a music condition are central to this study. Due to the narrative emphasis of this study, there was no control group, independent variable, or dependent

variable. Rather, a series of observations, surveys, and questionnaires were intended to determine how music might be used effectively with age-group swimmers, and children in general.

Results

The results of the study are organized into three categories. The statistics for each survey question are presented and children's narrative responses are reported in support or disagreement of each statistic. When applicable, notes from the observation log have been included to reinforce specific assertions or ideas. The graphs relating to each survey question show the number of responses in each category. Swimmers that circled either 1 (totally agree) or 2 (somewhat agree) were considered to be in agreement with the statement. Likewise, children that circled either a 4 or 5 were considered to be in disagreement with the statement. Circling a 3 indicated a neutral feeling toward the statement.

Figure 1 shows athlete's responses to the statement, "I like music playing during practice." Less than 1% of the swimmers did not agree with this statement. Ninety-six percent of the group, agreed with the statement. Figure 2 shows responses to a reverse-ordered statement, "I don't like music playing during practice." One hundred percent of the group disagreed with this statement. These data support the first hypothesis that music makes swim practice more enjoyable. The narratives indicated a variety of reasons for preferring music during practice to no music. One swimmer wrote, "... [music] makes the atmosphere light and more fun instead of all work and no fun." Another swimmer asserted, "It's kind of nice to have something upbeat going." What swimmers don't realize is how their comments are inextricably linked to other components of motivation and performance, as found in previous research. "It makes practice more interesting," and "it makes practice more fun and that is a reward rather than practice being totally serious," were some of the reasons mentioned for enjoying music during practice.

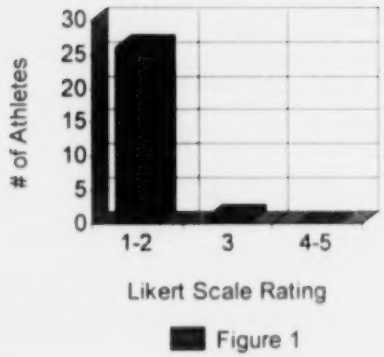

Figure 1

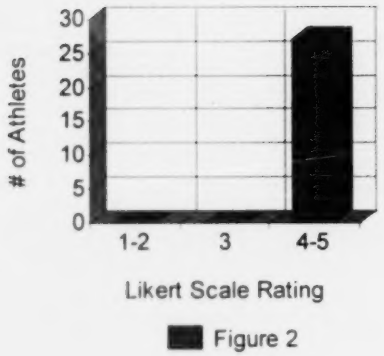

Figure 2

Figure 3 shows responses to the statement, "I don't find it difficult to concentrate when music is playing during practice." Seventy percent of the participants agreed with that statement, while 0% of the group was in disagreement with that statement. Similarly, 85% of the participants (Figure 4) disagreed with the reverse-ordered statement; "I find it difficult to concentrate when music is playing during practice." Fifteen percent of the participants were neutral and 0% agreed with the second statement. These figures fail to support the fourth hypothesis, while observations and narrative responses support the hypothesis. Observations and narrative responses indicate that music can indeed be a distraction. Most swimmers, as depicted in a later graph, find music to be distracting in the classroom. Perhaps the cognitive processes involved in reading and writing are more sensitive to extraneous noise than are the cognitive processes involved with physical activity. Results would have been similar to the

statement regarding music in the classroom had the statement read, "I don't find it difficult to concentrate when the coach is giving instructions and the music is playing."

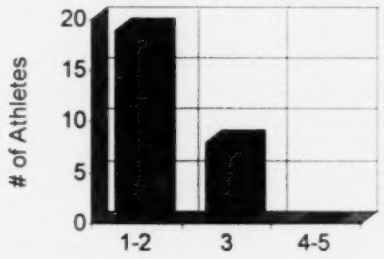

Figure 3

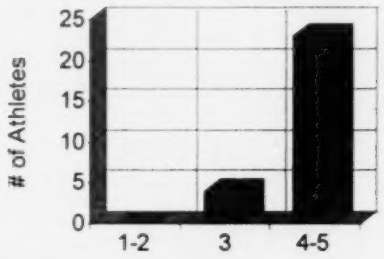

Figure 4

Responses to the statement, "Listening to music during practice makes me swim faster" are shown below (Figure 5). An equal number of athletes (44%) agreed with that statement, as remained neutral to the statement. On the other hand, 93% of the swimmers were quite certain that "Listening to music during practice [did not make them] swim slower" (Figure 6). These data support the second hypothesis, that music enhances athletic performance, although performance was not tested empirically. For the purpose of this study, perception of one's performance, mood, intensity and attitude are considered intricate parts of performance. Additionally, it has been determined that swimmers are able to endure physical activity longer when music is synchronized to physical movement (Hume and Crossman, 1992). In this study, dance-style music with a fast beat was used, as it was thought to most closely match the physical movements of the athletes. It was surprising that more swimmers did not feel that music made them swim faster during practice. As past research has demonstrated, however, there are a number of factors involved with performance. In this study, those included attitude, mood, on or off-task behavior, and perceptions of music. Narrative responses, in general, were extremely supportive of these performance factors. In fact, when asked if music should be played in gym class, swimmers responded enthusiastically, "...[music] gets you

motivated!" This question not only sought to explore swimmers' opinions in terms of music in a school setting, but also looked to find out "why" students liked music in gym class. These responses could then be reasonably generalized to other athletic settings. After all, "...[music] keeps [people] motivated to work out harder," presumably in all types of sports.

One swimmer thought music helped "...keep a beat," while another explained that "...[music] gives you a rhythm," as to why it should be played in gym class. Consistent with studies reviewed by Karageorghis and Terry (1997), one swimmer pointed out, "I think [music] is motivating because I swim faster when I sing in my head." A number of swimmers agreed with this idea, "I get a song stuck in my head and that helps me swim because I swim to the beat." Another swimmer noted, "Music makes me feel motivated and gives me energy, because I swim to the beat and if its a fast song then it helps me go faster. Plus it makes practice more fun and enjoyable. It also helps really, really, really hard sets seem a little easier." This swimmer touched on a number of important findings by Hume and Crossman (1992), in terms of motivation and swimming or moving to a beat. Of course, Karageorghis and Terry (1997) would be pleased to hear that this swimmer's perception of work output diminished as a result of music listening, despite the fact the swimmer is referring to intense training. Most of their work had implications at the "submaxial" level. That is, below maximum output or threshold. Some swimmers seem to get a lot more out of music than the instructor anticipated, apparent in this swimmer's account: "I think music most often is a motivator. It helps me set my goals and reach my goals. It also helps me relax and be less stressed about how my day went." In this scenario as described by the athlete, it is possible that both swimming and music attribute to improving her mood state, yet it may easier to attribute the feelings to music, as the effects of music on one's mood or attitude are more readily apparent.

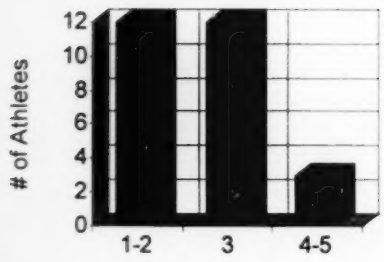

Figure 5

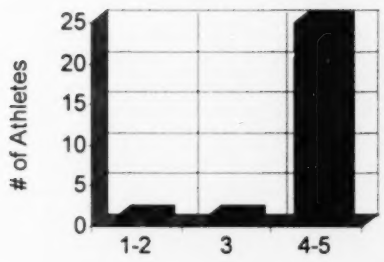

Figure 6

Displayed below (Figure 7) is the number of swimmer's responses to the statement, "Listening to music during practice is a reward." Eighty-nine percent of the respondents agreed with the statement that music was indeed a reward, while 0% disagreed. Approximately 1% of the group felt neutral toward the assertion. When provided with the opposite statement (Figure 8), "Listening to music during practice is not a reward," 63% of the group disagreed with the statement, while 22% remained neutral and approximately 1.5% agreed with the statement. These figures support the third hypothesis that swimmer's perception is that music is a reward. The hypothesis further specifies that this perception creates a willingness to earn the privilege of having music in practice. Although this data does not support the entire hypothesis, narratives and observations provide strong implications. Nevertheless, it is important to note that the majority of swimmers felt it was a reward, and therefore, it should be used as such. As Hume and Crossman (1993) found in their study, when specific guidelines as to what type of behavior will elicit the playing of music, children work hard to earn what they perceive to be a privilege or reward. According to the surveys, it seemed most children thought of music as a reward. The narratives, however, better revealed the opinions of children.

For example, one swimmer wrote, "...it's not a privilege at all for me because it's not the type of music I listen to." This statement reminds instructors and educators what

a powerful tool choice can be. In this study, the instructor would allow athletes to select music for the next day as another type of incentive. Not only were children rewarded for their outstanding performance during practice that day, but then given the responsibility of bringing a compact disc the following day. Having a choice in what is played is certainly an important factor in using music as a motivational tool. One swimmer agreed that music should be played in gym class, but proclaimed, "What they should do though, is get good music." In fact, Hume and Crossman (1992) found that swimmers "expended greater effort while listening to preferred music."

Another child wrote, "I think of music as a reward because it is something special a lot of people don't get. And I also find myself humming the tune of what is being played during long hard sets." This comment supports what Karageorghis and Terry (1997) found in their study on the psychological effects of music in sports. This swimmer chooses to hum a tune "during long hard sets," presumably as a way of diverting one's attention away from the physical pain and discomfort being experienced. It is unlikely that this athlete, or any other for that matter, consciously chooses to distract him or herself during intense exercise. Attention, however, is limited and therefore selective (Willingham, 1999). That is, humans can only fully attend to one thing at a time. Extraneous stimuli are being processed at some level and in some form, but we can only truly concentrate on one thing at a time. When an athlete chooses to hum a tune or sing a song, they are diverting their attention from the physical discomfort they are experiencing. Other swimmers also see it as a reward, but for other reasons perhaps. One swimmer writes, "We work really hard and I think that music is sort of our pay off." Yet some swimmers view music as a right, or something the instructor owes to them, not a privilege. This is evidenced in children's responses, including the statement, "I don't think it should be held as a reward because it's something I listen to everyday." One individual responded to the question, "No, because you should be able to listen to music all the time." Yet another swimmer felt, "After all our hard work we deserve it." Of

course, the same swimmer wrote. "[Music]...is more of something to make practice more enjoyable" as part of the response. It seems that most swimmers perceive music as a reward. Based on Karageorghis' (1997) research, those who do not think of it as a reward could be conditioned, in a sense, to at least see it as an incentive to work harder and/or lessen their perception of the amount of work they are doing. Another swimmer noticed some of the problems music could cause when he/she wrote, "...because if people are being bad and not listening then music will make it harder and harder to concentrate."

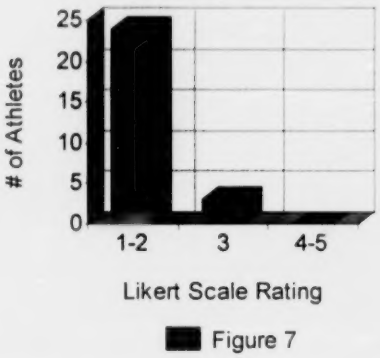

Figure 7

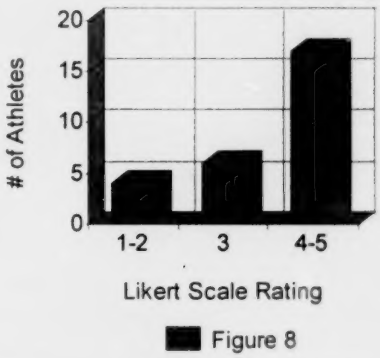

Figure 8

Swimmers were asked to rate their responses to the statement (Figure 9), "I don't think that the only place for music at school is in gym class." Just 52% of the children responding agreed with this statement, while 26% remained neutral and 22% disagreed. And when presented with the statement in reverse ("I think the only place for music at school is in gym class."), 81% of swimmers disagreed (Figure 10). One-and-a-half percent remained neutral to the second statement and less than 1% agreed. These results indicate that the majority of athletes in this group feel that music should be played in gym class, as well as the classroom. Narrative responses, on the other hand, are not entirely consistent with the survey results.

The narratives suggest a certain sensitivity exists among the children about when music should be played and when it would be inappropriate. Students felt music should be played in gym class for a number of reasons. One child suggested music as a means to

"...have fun while doing [the] work out and playing [the] games." Another swimmer felt that "...[music] sort of pumps [him] up," but is quick to remind if music were playing, "[his] friends would get distracted." Swimmers repeatedly mentioned dancing and exercising to the beat. There was a certain dichotomy, however, that repeatedly showed up in the narratives. One athlete explained the reason why music should not be played in gym class, as it "...might distract you (unless you're running)." There seems to be a desire for music in athletic settings, but with some stipulations when it comes to the classroom. Yet another child compared music in gym class to having music at swim practice, and wrote, "...just like swim practice we get motivated to go faster, or work harder." Some children seem to have noticed that music can distract as easily as it can motivate. But music should be played in gym class because "...you don't need to constantly concentrate in gym," while adding, "and it is more fun that way." Other swimmers shared this opinion. The results indicate that gym class is not the only place that children would like to hear music, but at the same time the children realize that it is not appropriate to have music playing all of the time.. Nevertheless, as instructors and educators, one cannot forget that children learn in a variety of ways. Furthermore, children are not always motivated in the same way.

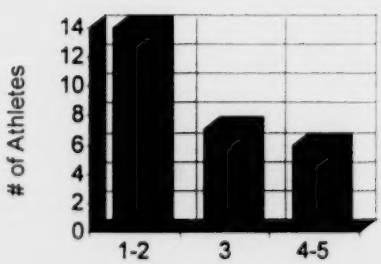

Figure 9

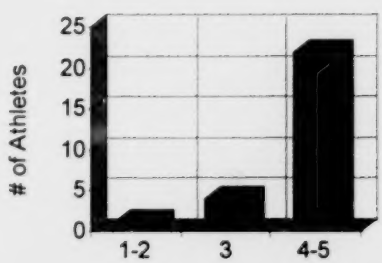

Figure 10

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Swimmers' responses to the predication, "I think my teacher should play music in the classroom" are shown below (Figure 11). Sixty-seven percent of the swimmers thought music should be played in the classroom, while 23% remained neutral and less than 1% disagreed. When given the statement, "I don't think my teachers should play music in the classroom," results were nearly identical (Figure 12). Seventy-percent of the swimmers disagreed with the statement, while 29% remained neutral, and less than 1% were in agreement. These data reassert swimmer's attitudes toward music in the classroom. The majority of students in this group think their teachers should play music in the classroom, yet narrative responses are inconsistent with these figures, suggesting that music is in fact a large distraction when played in the classroom. Narrative responses seem to be consistent with the idea that particular circumstances make music inappropriate at times in a classroom setting. For instance, one swimmer replied, "No, [music should not be played in the classroom] because it makes it much harder to concentrate, especially if we are doing a test or hard reading." Another participant noticed that when music is being played in the classroom, "...[they] talk too much and can't take tests as well." One swimmer made a distinction between academics and sports when asked about music in the classroom by asserting, "I don't think so because you need to concentrate a greater percentage of the time in school than in swimming." In fact, most participants qualified their responses with particular circumstances, as "...it depends on what we're doing. My math teacher sometimes turns on the radio and then it's distracting because we can't hear him as well (but maybe we don't really want to)."

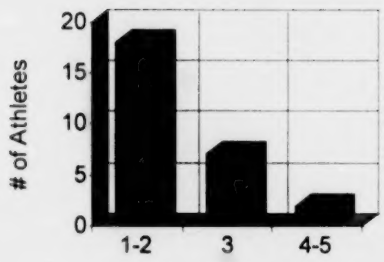

Figure 11

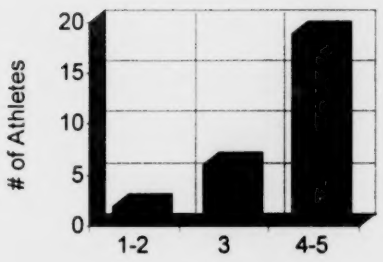

Figure 12

The results support the present study's hypotheses and sustain the findings of previous research. Through observations, survey results, and narrative responses, it is apparent that music listening during training sessions makes practice more enjoyable for the athletes. Furthermore, these data suggest an improved attitude and mood state among the group which results in improved performance. Although music listening was not explicitly used as a contingency based reward in this study, the majority of participants viewed music listening as a privilege. Lastly, the instructor's observations and children's narrative responses support the fourth hypothesis by attesting to the fact that music can be a significant distraction, particularly in a classroom setting.

Discussion

It is appropriate to look at these conclusions in more detail, as narrative responses seem to raise more questions than they provide answers. This study is especially complicated as it deals with intrinsic values, such as motivation, and individuals' perceptions. One's perception, of course, is extremely subjective and difficult to quantify in any way. Nevertheless, each method of evaluating how the swimmers' perceived music was valuable in gaining an overall perspective of the effectiveness of music listening in children's athletics.

The observation log served as a useful tool for categorizing the types of behavior and apparent attitudes of the children during music and non-music conditions.

Observations were not entirely consistent with the results of the survey and open-ended question responses. The objective of the observations was to record what type of behavior was typical when the music was playing and what seemed to be typical when the music was not playing? Was there any noticeable difference in the two conditions? The instructor noted, "There seems to be more conversations, and a lot more movement when the music is playing than when it is off." A more objective measure was used to find out if the apparent increase in conversation and movement during the music condition had an effect on swimmers' ability to focus their attention. The instructor timed how long it took for the group to give him their full attention once the phrase "May I have your attention, please," had been spoken. The instructor waited for 100% compliance, without exception. On average, it took swimmers 18.3 seconds to give the coach their full attention following a music condition, and an average of 16.5 seconds following a non-music condition. Coupled with observations, these figures indicate a greater length of time for the athletes to focus their attention on the instructor following the music condition than the non-music condition. Another important note from the observation log reads,

> "Prior to the final session of a three day meet, swimmers were exhausted and sitting around lethargically while waiting to warm-up. Once the music was turned on at a high volume, the swimmers began stretching, talking and laughing. The music made their mood do a 180 degree turn!"

This statement strongly supports the second hypothesis, which states that music improves the moods and attitudes of swimmers, thereby improving athletic performance. Although the latter half of the statement was not empirically improved, this study considers attitude to be a part of performance. That is, how athlete's feel about training or competing is directly related to performance in terms of the athlete's perception. Previous research has demonstrated that providing music as a contingent reward has "improved practice efficiency. . .and effectively improved performance" (Hume and Crossman, 1992).

Likewise, Karageorghis and Terry (1997) noted "that music can influence mood, and mood, in turn, can influence performance." Not only can music enhance athletic performance, but upbeat music may "[lower] anger, fatigue, and depression significantly (Karageorghis and Terry, 1997). Although music was not consistently presented as a contingent reward, the instructor occasionally told the children that the music would be turned on or off as a result of their behavior.

Similarly, the survey was intended to determine whether or not the children perceived music listening as a performance enhancing reward or privilege that they are willing to earn. In other words, do the children feel as if it alters their mood in a positive way and does music motivate them, thereby enhancing athletic performance. Fortunately, the survey provided tremendous insight into children's perception of music in an athletic environment, an academic environment, as well as personal feelings about music during training. Overall, the surveys indicated that using music in an athletic setting motivates swimmers in terms of athletic performance and has a positive impact on their mood and attitude. Hume and Crossman (1992) found that 96% of the athletes in their study liked having music as a part of training, "believing that music made training easier, reduced the psychological stress of training, and improved skill mastery." In support of Hume and Crossman's findings, Karageorghis and Terry (1997) asserted "Results showed a significantly lowered perceived exertion during the music condition when compared to the control condition." Not only is there evidence to support the effectiveness of music in improving athletic performance, but past research has found that music can help athletes mentally prepare for competition. Visualization is an important skill in the sport of swimming, and in athletics in general. Karageorghis and Terry (1997) found "that music can enhance the impact of imagery, and hence, may contribute to the pre-performance strategies." In fact, sport psychologists have recommended music as a way to get mentally ready to compete, and in some cases, to help overly anxious athletes calm down before competition (Karageorghis and Terry,

1997). Survey results also indicated the desire to have music as a part of the classroom environment. Although, as narrative excerpts demonstrate, children realize there are appropriate and inappropriate times for music to be played in a classroom setting.

The ability to concentrate while listening to music is what makes this an issue of debate at all. It has already been stated that attention is both limited and selective (Willingham, 1999). That is, any person can only fully attend to one thing at a time. If the choice is between music and writing an essay, will students be distracted? Should music be played in the classroom? Narrative responses pointed out that, in some cases and under particular conditions, students thought music should be played in the classroom, but for the most part it was thought to be distracting. One swimmer wrote, "Sometimes, it can be distracting if you really had to concentrate. But sometimes it's stimulating to have music playing." In another swimmer's opinion, playing music in the classroom would "...make [them] feel like the teachers appreciated [them]." This participant's response once again underscores the idea that music can indeed be effectively used as reinforcement for on-task behavior.

On the other hand, some athletes were more sensitive to the issue, reporting that "Yes [music should be played] because it is relaxing and makes you get less stressed over class work." But the same participant continued, "No, because you may not have good concentration on your class work." The participant did not reveal what type of music should be played. Another swimmer wrote, "I think music should be played in class, but it should be soft music because rock music disrupts your thinking." Another response suggested the different types of activities where music may be acceptable or not. This swimmer explained, "No, [music should not be played] because some people find it hard to concentrate on school work when its playing, but if they're drawing or something its fine." Swimmers that agreed with playing music in the classroom often cited, music would "...make school more fun," or "...it's relaxing," as the reason for wanting music in the classroom.

Music does not have to played continuously to be an effective reward, and can in fact be a significant distraction if played continuously (Hume and Crossman, 1992). But the idea of rewards, intrinsic motivation, and extrinsic motivation is a complex issue. Most adults assume that children participate in sports as a result of a sincere interest in that sport, or for fun, enjoyment, and thrills. Past research has demonstrated that extrinsically motivated activities do not require the use of extrinsic rewards, which may actually be detrimental to intrinsic motivation. The high attrition rate in youth sports suggests that intrinsic motivation is somehow being extinguished in children participating in youth sports (Courneya and McAuley, 1991). One of the explanations for this phenomenon is that the use of rewards, particularly if the reward is perceived as driving the behavior, significantly reduces intrinsic motivation (Courneya and McAuley, 1991). In the case of education, by not following the minimally-sufficient principle, parents have succeeded in actually diminishing children's intrinsic motivation to learn and participate in the classroom. That is, since parents often perceive school as work that the child is not actively pursuing, large rewards are offered for tasks that the child might actually be intrinsically motivated to do anyway. Athletic activities, on the other hand, are generally perceived as choices made by the child and rewards are therefore often more appropriate and less devastating to intrinsic motivation. Essentially, extrinsic rewards can undermine the success of intrinsic motivation. Therefore, in an athletic or classroom setting, one must carefully consider the size of the reward (large or small) and the behavior being rewarded.

In general, it seemed that having music in the classroom makes it difficult to concentrate and is a major distraction when students are working, as reported by the swimmers in their questionnaires. However, participants' comments raise an important issue. Under no circumstance was it reported that music was used as a contingency-based reward in the classroom. Students either found the music relaxing or they found it to be a distraction, making it difficult to hear and concentrate. As previous research has

shown, music can be used as a reward or reinforcement for on-task behavior. Madsen and Forsythe (1973) found that students' performance on mathematical problems increased dramatically during a 20 minute work period when rewarded with a contingent 10 minute music listening period. As one swimmer pointed out, having music playing while giving instructions is absolutely counter-productive. It is virtually impossible to attend to two things at once, so by having music playing in an athletic or academic environment during a time where concentration is necessary, one is almost guaranteeing a lack of attention among students.

There is no doubt that music can be used as an effective means of motivation to change a child's current outward emotional state, or to shape and reinforce behavior, as well as make practice more enjoyable. The first and second hypotheses were thereby supported with data collected through observations, surveys, and narrative responses. However, it should be noted that these effects are only possible if used in conjunction with strict guidelines, well though out rules, and clear expectations. That is, in order to achieve these outcomes, music must be used as a contingency-based reward. Swimmers generally perceived music listening as a reward, although a contingency plan would surely enhance this perception. Observations, as well as children's responses on each of the test measures, indicated that a using music as a reward contingent upon performance and on-task behavior would be an effective and efficient way of rewarding behavior. In terms of the fourth hypothesis, most swimmers did non feel as if music served as a distraction during swim practice. Likewise, the children did not perceive music as a distraction during gym class, running, or drawing. Indeed, there was a trend for students to identify activities requiring low concentration as appropriate for music listening. On the other hand, there was a general consensus supporting the fourth hypothesis, in that, many swimmers claimed that music served as a distraction in the classroom. Additionally, the coach noted in the observation log, that while working with a small group on specific stroke skills, the music playing for the rest of the group "was a

tremendous distraction to the swimmers that I was working with and had to be turned off." The hypotheses were supported by the observations, survey results, and narrative responses.

This study was not without limitations. Future research in this area, based on past research and the findings herein, should look at how contingent music listening effects long-term intrinsic motivation of the athlete's willingness to participate in the sport. Empirically testing athlete's achievement in music and non-music conditions would better illustrate the effects of music on swimmers' performance. This study should be done in a facility with an underwater speaker system to fully manipulate the effects of extrinsic motivation on performance. In this study, there were a number of uncontrolled variables and interactions that are assumed to be taking place in a social, athletic setting. Furthermore, future research should compare the ways in which music and non-music conditions interact with the attention of children, comparing the advantages and disadvantages. The effects of response-contingent music as a means to modify classroom behavior and increase on task behavior could be further investigated, expanding on the research of Madsen and Forsythe (1971). Lastly, coaches would expect that participating in sports takes as much concentration as participating in class, yet children identified athletics, running, and drawing as taking less of one's concentration than reading and writing. Future research may want to investigate and compare the cognitive processes involved in athletics with those involved in reading and writing. There is no doubt that music can be an effective tool in motivating children, but how it is used can have a profound effect on the outcome. Future research should be concerned with identifying the ways to most efficiently use music in athletic and academic settings.

Appendix A

Observation Log

Observation Log

Notes

Date:
Time:
Observations:

Date:
Time:
Observations:

Date:
Time:
Observations:

Date:
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Observations:

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Observations:

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Date:
Time:
Observations:

Appendix B

Likert Scale Survey

Please read the following statements and rate your response on a scale of 1 to 5. Circle (1) if you totally agree with the statement, (2) if you somewhat agree, (3) if you feel neutral, (4) if you somewhat disagree, and (5) if you totally disagree with the statement.

I like music playing during practice.

1	2	3	4	5
Totally Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Totally Disagree*

Listening to music during practice makes me swim faster.

1	2	3	4	5
Totally Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Totally Disagree*

I think the only place for music at school is in gym class.

1	2	3	4	5
Totally Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Totally Disagree*

I don't think my teachers should play music in the classroom.

1	2	3	4	5
Totally Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Totally Disagree*

Listening to music during practice is not a reward.

1	2	3	4	5
Totally Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Totally Disagree*

I don't like music playing during practice.

1	2	3	4	5
Totally Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Totally Disagree*

I find it difficult to concentrate when music is playing during practice.

1	2	3	4	5
Totally Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Totally Disagree*

I don't think the only place for music at school is in gym class.

1	2	3	4	5
Totally Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Totally Disagree*

Listening to music during practice makes me swim slower.

1	2	3	4	5
Totally Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Totally Disagree*

Listening to music during practice is a reward.

1	2	3	4	5
Totally Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Totally Disagree*

I think my teachers should play music in the classroom.

1	2	3	4	5
Totally Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Totally Disagree*

I don't find it difficult to concentrate when music is playing during practice.

1	2	3	4	5
Totally Agree	*Somewhat Agree*	*Neutral*	*Somewhat Disagree*	*Totally Disagree*

Appendix C

Open-Ended Questionnaire

1. **Describe how you feel when music is playing during practice.**

2. **Do you think of music as a reward for good behavior? Why or why not?**

3. **Do you think music should be played in the classroom? Why or why not?**

4. **Do you think music should be played in gym class? Why or why not?**

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